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10/583,420	06/14/2006	Yoshihiro Goto	1141/76407	1687

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EXAMINER	
OTTO, JR, PAUL R	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,420	GOTO, YOSHIHIRO	
	Examiner	Art Unit	
	PAUL OTTO, JR	4146	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/14/2006 and 6/24/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 are pending for this application.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 12/16/2003. It is noted, however, that applicant has not filed a translation in the English language of the application as required by 35 U.S.C. 119(b).

Claim Objections

3. The following claims are rejected for lack of antecedent basis:

a. Claim 6 recites the limitation "the ellipses" in line 3.

b. Claim 7 recites the limitation "two ellipses" in line 3.

c. Claim 14 recites the limitation "the region extraction method" in line 1.

d. Claim 15 recites the limitation "at the one or more enlarged or reduced partial regions" in (r).

e. Claim 15 recites the limitation "the enlarged or reduced desired region" in (s).

f. Claim 19 recites the limitation "the command" in line 3.

g. Claim 19 recites the limitation "the command" in line 9.

h. Claim 19 recites the limitation "the desired region" in line 11.

Appropriate correction is required.

4. Claim 17 objected to because of the following informalities: tomographic is written as tomogrpahic in line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 recites the limitation "at least a partial contour of the element graphic" in (d). It is not clear if this refers to the same “at least a partial contour” in (c) and in (f), rendering the claim indefinite. For examination purpose, examiner interprets the recitation in (d) as “said at least a partial contour.”

7. Claim 14 recites the limitation "at least the partial region being synthesized” in (p). It is not clearly understood because what is being synthesized is at least parts of a desired region as cited in (o), rendering the claim indefinite. For purposes of examination “at least the partial region” is interpreted as referring to the desired region.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 3, 8, 9, 14, and 19 are rejected under 35 U.S.C. 102(b) as being unpatentable by Cowan et al. (WO 01/01859 herein “Cowan”).

10. As to claim 1, Cowan discloses, a region extraction method for extracting a specified region in an image including: **(Cowan, page 14, lines 10-11, where “left ventricular cardiac volume” is read as "specified region”),** (a) a step for displaying the image; **(Cowan, page 5, lines 23-24),** (b) a step for selecting a desired region in the image; **(Cowan, page 5, lines 37-38, where the desired region is selected by zooming and panning),** (c) a step for selecting an element graphic corresponding to at least a partial contour of a partial region in the desired region; **(Cowan, page 6, lines 32-35, selecting two or more points on the image define an element graphic),** (d) a step for approximating at least a partial contour of the element graphic to at least a partial contour in the partial region; **(Cowan, page 6, lines 32-37, calculating the volume has approximated the partial region),** (e) a step for repeating the steps (c) to (d) at least twice; **(Cowan, page 13, lines 1-2, the addition of “additional guide*/**

points" can be done at least twice to improve the estimate model), and (f) a step for making a first contour by combining at least a partial contour of the respective element graphics after the approximation. **(Cowan, page 12, line 38 through page 13 lines 1-2, where the combination of the additional guide points with the estimate model define at least a partial contour and the update of the estimate model with the additional guide points is read as an approximation which produces a first contour).**

11. As to claim 2, Cowan discloses, wherein the step (c) is for selecting the element graphics passing through a plurality of points being placed on at least a partial contour of the partial region or the vicinity of them. **(Cowan, page 10, lines 13-15, where the reference model is read as element graphics and boundary guide points being placed on at least a partial contour)**

12. As to claim 3, Cowan discloses, wherein the step (c) is for selecting the element graphics passing through one or more curves being placed on at least a partial contour of the partial region or the vicinity of them. **(Cowan, page 9, lines 17-21, where active surface is read as an element graphic passing through the curves defined by the endocardial boundary where the partial region is defined by the boundry guide points.)**

13. As to claim 8, Cowan discloses, wherein the step (c) is for displaying the element graphic with the image, and step (d) is for implementing the approximation of the displayed element graphics on the image. **(Cowan, page 9, lines 11-15, where contour lines are read as the plurality of element graphics)**

14. As to claim 9, Cowan discloses, wherein the following steps are included between the step (b) and the step (c): (g) a step for displaying at least one patterned graphic formed by a plurality of element graphics being combined; **(Cowan, page 9, lines 27-30, where the boundary points are read as element graphics, and the portion of the model formed by the boundary points is the pattern graphic),** (h) a step for selecting the one patterned graphic corresponding to the desired region; **(Cowan, page 6, lines 10-12),** (i) a step for displaying at least one of the plurality of element graphics configuring the selected patterned graphic along with the image, **(Cowan, page 9, lines 27-30),** and in the step (c), the selection of an element graphic from the displayed element graphics is implemented. **(Cowan, page 12, lines 35-38, where selection is accomplished through weight assignment.)**

15. As to claim 14, Cowan discloses, the region extraction method for extracting a specified region in an image including: **(Cowan, page 14, lines 10-11, where "left ventricular cardiac volume" is read as "specified region"),** (l) a step for displaying the image; **(Cowan, page 5, lines 23-24),** (m) a step for selecting a desired region in the image; **(Cowan, page 5, lines 37-38, where the desired region is selected by**

zooming and panning), (n) a step for extracting one or more partial regions from the desired region; **(Cowan, page 6, lines 32-35, where the estimate model is read as element graphic),** (o) a step for combining the one or more partial regions and synthesizing at least parts of the desired region; **(Cowan, page 9, lines 27-30, where the guide points define the partial regions and they synthesize the model which defines the desired regions),** and (p) a step for making at least a partial contour of the desired region of at least the partial region being synthesized as a first contour. **(Cowan, page 12, line 38 through page 13 lines 1-2, where the combination of the additional guide points with the estimate model define at least a partial contour of the desired region and the update of the estimate model with the additional guide points is read as synthesizing which produces a first contour).**

16. As to claim 19, Cowan discloses, a region extraction device comprising: **(Cowan, page 14, lines 10-11, where "left ventricular cardiac volume" is read as "specified region"),** a display means for displaying an image; **(Cowan, page 5, lines 4-5, where the image would be displayed on the display device),** an input means for receiving the command relating to the image; **(Cowan, page 5, lines 4-5, where the commands relating to the image would be entered using a keyboard and mouse),** and a calculating means for executing a desired image processing relating to the image, **(Cowan, page 5, lines 4-5, where the CPU is used to execute desired image processing related to the image),** wherein: the display means displays a plurality of element graphics along with the image; **(Cowan, page 9, lines 11-15, where contour**

lines are read as the plurality of element graphics), the input means receives the command for approximating at least a partial contour of the respective element graphics to at least a partial contour of the desired region; **(Cowan, page 6, lines 35-38, where the input means is by the user clicking with a mouse),** and the calculation means makes a contour by which at least a partial contour of the respective element graphics after the approximation is combined as a first contour. **(Cowan, page 12, line 38 through page 13 lines 1-2, where the combination of the additional guide points with the estimate model define at least a partial contour and the update of the estimate model with the additional guide points is read as an approximation which produces a first contour).**

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowan as applied to claim 1 above, in view of Fessler et al., ("Model-based 3-D reconstruction of branching vessels" Proceedings of the Annual International

Conference of the IEEE Engineering in Engineering in Medicine and Biology Society, Nov 1989, pages: 561-562 vol.2., herein after Fessler).

19. As to claim 4, Cowan teaches the method according to claim 1, but does not specifically disclose, wherein at least either size or shape of two or more of the plurality of element graphics is different from one another.

Fessler, however, specifically discloses, wherein at least either size or shape of two or more of the plurality of element graphics is different from one another. **(Fessler, Introduction section, paragraph 2, lines 4-6, where the plurality of element graphics are ellipses that can have different shapes, Object Model section, paragraph 1, lines 10-11).**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Fessler with the teachings of Cowan for improved image measurement because "the estimation error is well below a pixel." **(Fessler, Results section, paragraph 1, lines 2-3).**

20. As to claim 5, the claim is rejected for the same reasons as claim 4 above. In addition the combination of Cowan and Fessler teaches the region extraction method, characterized in that a shape of the element graphic is an ellipse. **(Fessler, Introduction section, paragraph 2, lines 4-6).**

21. As to claim 7, the claim is rejected for the same reasons as claim 5 above. In addition the combination of Cowan and Fessler teaches, wherein the step (d) is for implementing the approximation by mutually interlocking at least said two ellipses **(Fessler, Introduction section, paragraph 2, lines 4-6, where overlapping is read as interlocking)**.

22. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowan in view of Fessler as applied to claim 5 above, and in further view of Haselhoff,(US Patent 6038446).

23. As to claim 6, the combination of Cowan and Fessler teaches the method according to claim 5, but does not specifically disclose, wherein step (d) is for implementing the approximation by changing the position, size or shape of the ellipses by moving the major axis point, minor axis point or center point of the ellipses or rotating the ellipses around the center point.

Haselhoff, however, specifically discloses, wherein step (d) is for implementing the approximation by changing the position, size or shape of the ellipses by moving the major axis point, minor axis point or center point of the ellipses or rotating the ellipses around the center point. **(Haselhoff, column 5, lines 61-67, where t and z are the major/minor axis points column 6, lines 14-17, center point, column 6, lines 43-44,**

and rotation about a center point, column 8, lines 47-50. column 7, line 57-61, describe the movement where second estimate is read as approximation)

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Haselhoff with the teachings of Cowan and Fessler for improved organ estimation because "use of the same property for determining the first and the second reference enables the operator to make a better visual estimate." **(Haselhoff, column 2, lines 12-14).**

24. Claims 10-13, 15, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowan as applied to claims 1, 14, and 19 above, in view of Daugman, (US Patent 5291560).

25. As to claim 10, Cowan teaches the method according to claim 1, but does not specifically disclose, wherein the following steps are included after the step (f): (j) a step for obtaining a second contour based on the first contour; and (k) a step for extracting the region including a stratified region held between the first contour and the second contour.

Daugman, however, specifically discloses, wherein the following steps are included after the step (f): (j) a step for obtaining a second contour based on the first contour;**(Daugman, column 2, line 55-59, where "circular pupillary boundary" is**

read as first contour and "circular boundary between the iris and sclera portions" is based on the second contour), and (k) a step for extracting the region including a stratified region held between the first contour and the second contour.**(Daugman, column 2, lines 55-59, where isolate is read as extract).**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Daugman with the teachings of Cowan for improved region estimation by providing a "system for extremely reliable and rapid identification." **(Daugman, column 2, lines 34-36).**

26. As to claim 11, the combination of Cowan and Daugman teaches the method according to claim 10, further comprising, wherein the step (j) is for obtaining the second contour by enlarging or reducing the first contour with a predetermined magnification. **(Daugman, column 7, line 68, where the outer boundary equation (equation 2) is dependent on the enlarging or reduction of the papillary radius which is the first contour)**

27. As to claim 12, the combination of Cowan and Daugman teaches the method according to claim 10, further comprising, wherein the step (j) is for obtaining the second contour by changing a position, size or shape of the element graphics that are used upon obtaining the first contour in the step (f). **(Daugman, column 7, line 30-32, where the position of the second contour is the distance from the papillary center**

which is decided by the first contour, and the size and shape of the second contour depend on the papillary radius from the first contour)

28. As to claim 13, the combination of Cowan and Daugman teaches the method according to claim 10, further comprising, wherein the step (k) is for extracting one of only the stratified regions, **(Daugman, column 8, line 15-18, where the iris is read as the stratified region),** a region on the side of the first contour including the stratified region or a region on the side of the second contour including the stratified region. **(Daugman, column 8, line 15-18, where the iris is next to the papillary boundary read as first contour and the limbus read as second contour).**

29. As to claim 15, Cowan teaches the method according to claim 14. Cowan further discloses, wherein the following steps are included after the step (p): (q) a step for enlarging or reducing the one or more partial regions with a predetermined magnification; **(Cowan, page 5, lines 36-38, where zoom is read as the ability to zoom in, enlarge or zoom out, reduce, and through the zooming the window can cover one or more partial regions),** (r) a step for combining the one or more enlarged or reduced partial regions, and synthesizing at least a part of the desired region being enlarged or reduced; **(Cowan, page 9, lines 27-30, where the guide points define the partial regions and they synthesize the model which defines the desired regions),** (s) a step for making at least a partial contour of at least a part of the enlarged or

reduced desired region as a second contour; **(Cowan, page 9, lines 17-21 where the placement of boundary points decides the enlarged or reduced desired region)**

Cowan does not disclose, (t) a step for extracting a region including at least a stratified region being held between the first contour and the second contour.

Daugman, however discloses, (t) a step for extracting a region including at least a stratified region being held between the first contour and the second contour. **(Daugman, column 2, lines 55-59, where isolate is read as extract).**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Daugman with the teachings of Cowan for improved region estimation by providing a "system for extremely reliable and rapid identification." **(Daugman, column 2, lines 34-36).**

30. As to claim 20, Cowan teaches the method according to claim 19, but does not specifically disclose, wherein the calculating means obtains a second contour based on the first contour, and extracts a region including at least a stratified region held between the first and second contour.

Daugman, however, specifically discloses, wherein the calculating means obtains a second contour based on the first contour, **(Daugman, column 2, line 55-59, where**

"circular pupillary boundary" is read as first contour and "circular boundary between the iris and sclera portions" is based on the second contour), and extracts a region including at least a stratified region held between the first and second contour. **(Daugman, column 2, lines 55-59, where isolate is read as extract).**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Daugman with the teachings of Cowan for improved region estimation by providing a "system for extremely reliable and rapid identification." **(Daugman, column 2, lines 34-36).**

31. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowan in view of Daugman, as applied to claim 10 above, and in further view of Barequet et. al (Piecewise-Linear Interpolation between Polygonal Slices, Proceedings of the tenth annual symposium on Computational geometry, Stony Brook, New York, 1994, pages 93 – 102. herein after Barequet).

32. As to claim 16, the combination of Cowan and Daugman discloses the method according to claim 10, further disclosing, wherein the following steps are included after the step (k): (u) a step for changing the image and repeating the steps (a).about.(k) at least twice; **(Cowan, page 11, lines 29-31, where the local processing changes the image and can be repeated at least twice, figure 1 element 128)**

The combination of Cowan and Daugman does not specifically disclose, in the case there is a plurality of images, (v) a step for synthesizing 3-dimensional regions using the extraction region on each of the images.

Barequet specifically discloses, in the case there is a plurality of images, **(Barequet, Section 2, paragraph 1, lines 1-5, where parallel planar slices are read as images)**, (v) a step for synthesizing 3-dimensional regions using the extraction region on each of the images. **(Barequet, Section 2, 3. Reconstructing the surface, lines 1-4, where examiner interprets stitching contour portions for surface reconstruction as synthesizing 3-dimensional regions as also interprets contour portion as extracted region)**.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Barequet with the teachings of Cowan and Daugman for improved contour estimation by avoiding "the introduction of counter-intuitive bridges between contours." **(Barequet, abstract, lines 16-18).**

33. As to claim 17, the combination of Cowan, Daugman and Barequet discloses the method according to claim 16, further disclosing, in the case that the plurality of images are tomogrpahic images being mutually different slices, **(Barequet, Section 2, lines 1-5, because the slices are parallel they are mutually different)**, wherein the following step is included between the steps (u) and (v): (w) a step for obtaining the first contour,

(Barequet, Section 2, lines 1-5, where the first slice in the pair with a polygonal contour is read as a "first contour"), the second contour and the stratified region, of the region where the first contour was not able to be obtained, **(Barequet, Section 2, lines 1-5, where the second slice in the pair with a polygonal contour is read as a "second contour" and the area between the pair of slices is read as the stratified region, further both the second contour and the stratified region are where the first contour was not able to be obtained since they are parallel to the first contour),** based on the first contour in the slice of which the first contour was able to be obtained. **(Barequet, Section 2, 3. Reconstructing the surface, lines 1-4, the stratified region depends on the reconstruction between the first and second contour is constrained to be parallel to the first contour so they are both based on the first contour).**

34. As to claim 18, the combination of Cowan, Daugman and Barequet discloses the method according to claim 16, further disclosing, in the case that the plurality of images are the tomographic images being mutually different slices, **(Barequet, Section 2, lines 1-5, because the slices are parallel they are mutually different)**, wherein the following step is included between the steps (u) and (v): (x) a step for obtaining the stratified region of the region where the stratified region was not obtained, **(Barequet, Section 1, paragraph 15, lines 3-6, the band is a stratified region where one had not been obtained)**, based on the stratified region in the slice of which the stratified region was obtained. **(Barequet, Section 1, paragraph 15, lines 6-11, the original**

contours is interpreted by the examiner to be where a stratified region was obtained).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. US Patent 5107838, discloses contour projection.

b. US Patent 6442287, discloses elliptical element graphics

c. US Patent 6154560, discloses elliptical element graphics

d. US PGPub 2002015028 discloses inner/outer contour extraction.

e. US Patent 5318026 discloses deformable ellipses

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL OTTO, JR whose telephone number is (571)270-3391. The examiner can normally be reached on Monday - Thursday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nabil El-Hady can be reached on (571) 272-3963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. O./
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